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EXPOSURE THERAPY FOR PTSD

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A variety of terms have been used to label therapy that consists of prolonged exposure to anxiety-provoking stimuli. These include flooding, imaginal exposure, in vivo exposure, prolonged exposure, and directed exposure. In this paper we will refer to all these therapy programs collectively as exposure. Exposure methods share the common feature of helping anxious patients confront their fear-evoking stimuli with the aim of reducing the irrational fear or anxiety. Most exposure therapy programs do not consist solely of exposure but include other components such as psychoeducation or relaxation training. The exposure components, however, are typically more central and occupy much more time than these other components; the latter are often presented as preliminary ways of building up to the exposure. Details on the implementation of exposure for PTSD have been provided in Foa and Rothbaum (1998).

Exposure has been a treatment of choice for many anxiety disorders for several decades. In treatment programs for PTSD, imaginal exposure typically involves repeated reliving of the traumatic event. In vivo exposure involves planned confrontations with situations or objects associated with the trauma and that are therefore anxiety-evoking. The first reference in the modern literature to imaginal exposure applied to PTSD was a case study by Keane and Kaloupek published in 1982. Only three controlled studies have examined the utility of prolonged imaginal exposure (PE) for reducing PTSD and related pathology in male Vietnam veterans. Treatment was conducted over 6 to 16 sessions. In one study (Cooper & Clum, 1989), all clients received the "standard" PTSD treatment (weekly individual and group therapies) in addition to exposure. In the second study (Keane et al., 1989), patients receiving PE were compared to a waiting-list control group (WAIT). During each session, patients were initially instructed to relax. The patients subsequently received 45 minutes of imaginal flooding, followed by relaxation. In the third study, all patients received a group treatment milieu program; one-half received additional PE, and the remaining patients received weekly individual traditional psychotherapy (Boudewyns & Hyer, 1990; Boudewyns et al., 1990).

All three studies found some benefit to the PE patients compared to the control group, but the effects were small. In the Cooper and Clum (1989) study, PE reduced the PTSD symptoms, but had little effect on depression or trait anxiety. A mixed picture emerged from the Keane et al. (1989) study: therapists rated exposure clients as more improved on PTSD symptoms than control clients, but on self-report measures of these symptoms, no differences were detected. However, exposure patients did rate themselves as more improved on general psychopathology measures than did those in the WAIT control. Boudewyns and Hyer (1990) found no group differences on psychophysiological measures, but at the three-month follow-up, the exposure group improved more on the Veterans Adjustment Scale (VAS). Regardless of treatment, a positive relationship was found between psychophysiological reduction to combat-related stimuli following treatment and improvement on the VAS. In further analysis of the data with additional patients, a higher percentage of the exposure-treated clients were classified as successes when compared with those receiving traditional therapy (Boudewyns et al., 1990). An uncontrolled report found that flooding benefited Vietnam veterans with PTSD only on avoidance symptoms as measured by the IES and self-recorded number of daily intrusions (Pitman et al., 1996). Cautions regarding using exposure with guilt memories rather than anxious memories have been put forward by Pitman et al. (1991).

Recently, a new medium for conducting exposure therapy has been introduced: Virtual Reality Exposure (VRE; Rothbaum et al., in press). VRE presents the user with a computer-generated view of a virtual world that changes in a natural way with head motion. During VRE sessions, clients wear the head-mounted display with stereo earphones that provide visual and audio cues consistent with being in a "Virtual Vietnam." Clients in one investigation are exposed to two virtual environments, a Huey helicopter flying over a virtual Vietnam and a clearing surrounded by jungle. In this way, patients are repeatedly exposed to their most traumatic memories but immersed in Vietnam stimuli. The results of the first patient to complete the Virtual Vietnam treatment are encouraging: scores on all measures decreased from pre- to post-treatment.

The first report on the application of exposure therapy to PTSD rape victims appeared in 1991

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with a controlled study by Foa et al. (see also a case report by Rothbaum and Foa, 1991). Rape victims with PTSD were randomly assigned to one of four conditions: stress inoculation training (SIT), prolonged exposure (PE), supportive counseling (SC), or wait-list control (WL). SIT is a treatment package of anxiety management techniques developed for victims who remained highly fearful three months after being raped (Kilpatrick et al., 1982). SC utilized a problem-solving approach for daily problems. Treatments were delivered in nine biweekly 90-minute individual sessions. All conditions produced improvement on all measures immediately post-treatment and at follow-up. SIT produced significantly more improvement on PTSD symptoms than WL immediately following treatment. At follow-up, PE produced superior outcome on PTSD symptoms. Clients who received PE continued to improve after treatment termination, whereas clients in the SIT and SC conditions evidenced no change between post-treatment and follow-up. This study demonstrated that rape victims tolerated exposure therapy well as no differential dropout emerged. The case study indicated that other traumatic conditions and complications, such as conversion mutism, could also be alleviated by exposure.

A second controlled study compared PE, SIT, the combination of SIT and PE, and a wait-list control group in clients with PTSD post sexual and non-sexual assault (Foa et al., in press). All three active treatments showed significant improvement in PTSD symptoms and depressive symptoms at post-test, and the wait-list did not improve. These treatment effects were maintained at six-month follow-up. On most outcome measures PE was more effective than the other two treatments, although this difference did not always reach significance. An examination of patients who achieved good end-state functioning showed that 21% of patients in SIT, 46% of patients in PE, and 32% of patients in SIT/PE achieved this goal at post-treatment. At six-month follow-up, 75% of patients in PE, 68% of patients in SIT, and 50% of patients in SIT/PE lost the PTSD diagnosis, whereas all wait-list patients retained the diagnosis. The hypothesis that the combined treatment would be superior was not supported. The authors suggested that these results may be due to the fact the clients in that condition actually received *less* prolonged imaginal exposure and SIT training than participants in the individual treatments, as treatment sessions were all equal in length. In a third study, 9-12 weekly sessions of PE alone were compared to PE combined with cognitive restructuring. Preliminary results indicated that both treatments were highly effective, but PE alone was more efficient. More than half the clients in that group achieved over 70% improvement on PTSD symptoms after 9 sessions; only 15% of the combined group achieved that status after 9 sessions, and those remaining required 3 additional sessions to arrive at the same outcome (Foa, personal communication). Versions of the PE program have been helpful in preventing the development of chronic PTSD following rape (Foa et al., 1995a) and in treating PTSD in abused children (Deblinger et al., 1990).

Cognitive Processing Therapy (CPT) is a combination

therapy for rape victims with PTSD that includes education, exposure, and cognitive restructuring components. Results were very encouraging for the efficacy of CPT in this population (Resick & Schnicke, 1992). In a preliminary report of a controlled trial comparing CPT, PE, and Wait-list Control groups, Nishith and Resick (in press) reported that female sexual assault survivors who received CPT ($n = 29$) or PE ($n = 26$) were significantly more improved than the Wait List Control ($n = 29$) group from pre- to post-treatment on PTSD and depressive symptomatology. CPT and PE were equally effective in reducing PTSD.

Additional studies also provide support for the efficacy of exposure treatment for PTSD in samples heterogeneous with regard to their traumas. Richards et al. (1994) treated participants with PTSD with either four sessions of imaginal exposure followed by four sessions of in vivo exposure, or in vivo followed by imaginal exposure. Patients in both treatment conditions improved considerably. At post-treatment and at one-year follow-up, no patients met criteria for PTSD. The only notable difference between the two exposure types was in the area of phobic avoidance, for which in vivo exposure appeared to be more effective regardless of the order in which it was presented. In another study of outpatients with PTSD resulting from a variety of traumas (Marks et al., 1998), exposure, cognitive therapy, and exposure plus cognitive therapy combination were equally successful in reducing PTSD at post-treatment and 6-month follow-up. All three treatments were more effective than relaxation.

Exposure therapy was compared to cognitive therapy in a mixed sample of trauma survivors (Tarrier et al., 1999). There was a significant improvement on all measures at post-treatment which was maintained at follow-up for both treatments, with no significant differences between the two treatments. An open trial of eight weekly sessions of imaginal and in vivo exposure treatment with mixed trauma survivors with PTSD also suggested that exposure was efficacious (Thompson et al., 1995). Exposure therapy combined with stress inoculation training was helpful for survivors of motor vehicle accidents (Hickling & Blanchard, 1997).

How does exposure therapy work? It has been suggested that PTSD, like other anxiety disorders, reflects the presence of a pathological fear structure in memory (Foa & Kozak, 1986; Foa et al., 1989). Memory fear structures are thought to include representations of stimuli, responses, and their meaning. The memory structure is activated by trauma-related information. Because the number of stimuli and response representations is thought to be particularly large in the trauma-fear structure of individuals with PTSD, it is easily accessed, resulting in PTSD symptoms.

Emotional processing theory proposes that successful therapy involves correcting the pathological elements of the fear structure (Foa & Kozak, 1986). Exposure procedures consist of confronting the patient with trauma-related information, thus activating the trauma memory. This activation constitutes an opportunity for corrective

information to be integrated in the trauma memory, and thus modify the pathological elements of that memory. Of particular relevance to PTSD is a study demonstrating that fear activation during reliving of the traumatic memory (imaginal exposure) promotes successful outcome (Foa et al., 1995b). Several mechanisms are thought to be involved in the specific changes that successful therapy promotes in patients with PTSD. First, repeated imaginal reliving of the trauma is thought to promote habituation and thus reduce anxiety previously associated with the trauma memory, and correct the erroneous idea that anxiety stays forever unless avoidance or escape is realized. Second, the process of deliberately confronting the feared memory blocks negative reinforcement connected with the fear reduction following cognitive avoidance of trauma-related thoughts and feelings. Third, repeated reliving of the trauma in a therapeutic, supportive setting incorporates safety information into the trauma memory, thereby helping the patient to realize that remembering the trauma is not dangerous. Fourth, focusing on the trauma memory for a prolonged period helps the patient to differentiate the trauma event from other non-traumatic events, thereby rendering

the trauma as a specific occurrence rather than as a representation of a dangerous world and of an incompetent self. Fifth, the process of imaginal reliving helps change the meaning of PTSD symptoms from a sign of personal incompetence to a sign of mastery and courage. Sixth, prolonged, repeated reliving of the traumatic event affords the opportunity for focusing on details central to negative evaluations of themselves and modify those evaluations. The mechanisms most salient during *in vivo* exposure are the correction of erroneous probability estimates of danger and habituation of fearful responses to trauma relevant stimuli. Other theorists have emphasized other cognitive aspects (Brewin et al., 1996).

The results from the studies discussed above consistently support the efficacy of imaginal and *in vivo* exposure for the treatment of PTSD resulting from a variety of traumas. In general, these studies are well-controlled, leading to strong conclusions. Exposure therapy tends to be relatively short-term and well-tolerated, even by very impaired individuals, and thus should be considered a treatment option in many cases of PTSD.

SELECTED ABSTRACTS

BOUDEWYNS, P.A., & HYER, L. (1990). **Physiological response to combat memories and preliminary treatment outcome in Vietnam veteran PTSD patients treated with direct therapeutic exposure.** *Behavior Therapy*, 21, 63-87. Two individual treatment conditions for PTSD in Vietnam veterans were compared: Direct therapeutic exposure (DTE) was compared to conventional one-on-one counseling (controls). All patients received an intensive group treatment milieu program in a VA inpatient treatment program specifically designed for PTSD. Physiological responses to imaginal exposure scenes of stressful memories of combat were recorded. These physiological measures were taken prior to treatment, and immediately following treatment. Three physiological responses were evaluated: Heart rate, frontalis electromyography, and skin conductance. All three measures indicated strong responding to the exposure scenes at both pre- and post-treatment. While there were no significant differences between the treatment conditions in physiological responding after therapy, there were trends that indicated that the DTE group had decreased physiological responding to the exposure scenes when compared to controls that could prove significant at planned follow-up. Subjects were also given a preliminary psychological and behavioral evaluation to determine treatment outcome at three months following treatment. This evaluation indicated that the DTE-treated group improved when compared to controls. Results supported the notion that those subjects who did evidence decreased physiological responding to the imaginal scenes immediately following treatment also improved psychologically at three months follow-up when compared to subjects who did not have reduced physiological responding, regardless of treatment received.

COOPER, N.A., & CLUM, G.A. (1989). **Imaginal flooding as a supplementary treatment for PTSD in combat veterans: A controlled study.** *Behavior Therapy*, 3, 381-391. The present study examined the incremental effectiveness of imaginal flooding (IF) over standard psychotherapeutic and pharmacologic approaches in the treatment of combat-related PTSD. Evidence was found

supportive of IF's effectiveness with regard to self-report symptoms directly related to the traumatic event(s), state anxiety, subjective anxiety in response to traumatic stimuli, and sleep disturbance. Flooding had no effect on level of depression or trait anxiety, indicating that it is a useful adjunctive treatment for PTSD but cannot likely be used as the sole vehicle of change.

FOA, E.B., HEARST-IKEDA, D., & PERRY, K.J. (1995a). **Evaluation of a brief cognitive-behavioral program for the prevention of chronic PTSD in recent assault victims.** *Journal of Consulting and Clinical Psychology*, 63, 948-955. The efficacy of a brief prevention program (BP) aimed at arresting the development of chronic PTSD was examined with 10 recent female victims of sexual and nonsexual assault who received 4 sessions of a cognitive-behavioral program shortly after the assault. Their PTSD and depression severity was compared with that of 10 matched recent female assault victims who received repeated assessments of their trauma-related psychopathology (assessment control; AC). The BP program consisted of education about common reactions to assault and cognitive-behavioral procedures. Two months postassault, victims who received the BP program had significantly less severe PTSD symptoms than victims in the control condition; 10 percent of the former group met criteria for PTSD versus 70 percent of the latter group. Five and a half months postassault, victims in the BP group were significantly less depressed than victims in the AC group and had significantly less severe reexperiencing symptoms.

FOA, E.B., & KOZAK, M.J. (1986). **Emotional processing of fear: Exposure to corrective information.** *Psychological Bulletin*, 99, 20-35. In this article we propose mechanisms that govern the processing of emotional information, particularly those involved in fear reduction. Emotions are viewed as represented by information structures in memory, and anxiety is thought to occur when an information structure that serves as a program to escape or avoid danger is activated. Emotional processing is defined as the modification of memory structures that underlie emotions. It

is argued that some form of exposure to feared situations is common to many psychotherapies for anxiety, and that confrontation with feared objects or situations is an effective treatment. Physiological activation and habituation within and across exposure sessions are cited as indicators of emotional processing, and variables that influence activation and habituation of fear responses are examined. These variables and the indicators are analyzed to yield an account of what information must be integrated for emotional processing of a fear structure. The elements of such a structure are viewed as cognitive representations of the stimulus characteristic of the fear situation, the individual's responses in it, and aspects of its meaning for the individual. Treatment failures are interpreted with respect to the interference of cognitive defenses, autonomic arousal, mood state, and erroneous ideation with reformation of targeted fear structures. Applications of the concepts advanced here to therapeutic practice and to the broader study of psychopathology are discussed.

FOA, E.B., RIGGS, D.S., MASSIE, E.D., & YARCZOWER, M. (1995b). **The impact of fear activation and anger on the efficacy of exposure treatment for posttraumatic stress disorder.** *Behavior Therapy*, 26, 487-499. This paper explores the hypothesis that fear activation during exposure treatment promotes improvement. Twelve female assault victims diagnosed with PTSD received treatment that included prolonged repeated reliving of the assault in imagination. Two measures of fear activation were used: Facial fear expression coded from videotapes of the first reliving session and the client's highest reported distress score during the same session. The results indicated that clients who evidenced more severe PTSD prior to treatment displayed more intense facial fear expressions during the first reliving of the assault and benefited more from treatment than did clients who had less severe PTSD and displayed less fear. In contrast, clients who reported more anger prior to treatment tended to display less fear expression during reliving of the trauma and benefited less from treatment than less angry clients. The relationship of pretreatment PTSD and anger severity to improvement seems to be mediated by fear facial expression and was not simply a product of regression toward the mean of extreme pretreatment scores. The results are discussed within an emotional processing theory of fear.

FOA, E.B., & ROTHBAUM, B.O. (1998). *Treating the trauma of rape: A cognitive-behavioral therapy for PTSD*. New York: Guilford. The aims of this book are to present a picture of PTSD and related problems that is grounded in the research literature and to provide a detailed guide to conducting effective treatment programs for clients who suffer from trauma-related psychological problems. The authors review the literature on posttrauma disturbances and on the relative efficacy of various treatments in overcoming these disturbances. They outline a theoretical account for why some victims develop PTSD and others do not, and they suggest that victims who develop certain beliefs are more likely to develop PTSD than victims who do not develop such beliefs. Different cognitive-behavioral techniques are presented rather than a step-by-step guide, because clients differ in the specifics of their problems and dysfunctional beliefs. Throughout they focus on women who have been sexually assaulted and as a result have developed chronic symptoms of PTSD, giving examples from their clinical practice. [Adapted from Text]

FOA, E.B., ROTHBAUM, B.O., RIGGS, D., & MURDOCK, T. (1991). **Treatment of posttraumatic stress disorder in rape victims: A comparison between cognitive-behavioral procedures and counseling.** *Journal of Consulting and Clinical Psychology*, 59,

715-723. Rape victims with PTSD ($N = 45$) were randomly assigned to one of four conditions: Stress inoculation training (SIT), prolonged exposure (PE), supportive counseling (SC), or wait-list control (WL). Treatments consisted of nine biweekly 90-min individual sessions conducted by a female therapist. Measures of PTSD symptoms, rape-related distress, general anxiety, and depression were administered at pretreatment, posttreatment, and follow-up ($M = 3.5$ months posttreatment). All conditions produced improvement on all measures immediately posttreatment and at follow-up. However, SIT produced significantly more improvement on PTSD symptoms than did SC and WL immediately following treatment. At follow-up, PE produced superior outcome on PTSD symptoms. The implications of these findings and direction for treatment and future research are discussed.

FOA, E.B., STEKETEE, G., & ROTHBAUM, B.O. (1989). **Behavioral/cognitive conceptualizations of post-traumatic stress disorder.** *Behavior Therapy*, 20, 155-176. In this chapter, we summarize only cognitive-behavioral interventions examined in well-controlled studies or in case reports that included at least semistructured assessments for evaluating treatment outcome. We begin with a brief review of the theory underlying the cognitive-behavioral treatment of PTSD. [Text, p. 492]

KEANE, T.M., FAIRBANK, J.A., CADDELL, J.M., & ZIMERING, R.T. (1989). **Implosive (flooding) therapy reduces symptoms of PTSD in Vietnam combat veterans.** *Behavior Therapy*, 20, 245-260. In a randomized clinical trial, 24 Vietnam veterans with a diagnosis of PTSD were randomly assigned either to a group receiving 14 to 16 sessions of implosive (flooding) therapy or to a waiting-list control. Standard psychometrics were administered before, following, and six months after treatment, and therapist ratings of symptomatology were concurrently obtained in personal interviews. When compared to the waiting-list control, those subjects receiving implosive therapy showed significant improvement across many of the psychometric measures and the therapist ratings of psychopathology. Specific changes in the re-experiencing dimension of PTSD, anxiety, and depression were notable, while treatment did not seem to influence the numbing and social avoidance aspects of PTSD. The results are discussed with respect to the importance of systematic exposure to traumatic, as one component of comprehensive treatment of combat-related PTSD, and the need for skills training interventions directed at improving social competence in interpersonal interactions.

KEANE, T.M., & KALOUPEK, D.G. (1982). **Imaginal flooding in the treatment of posttraumatic stress disorder.** *Journal of Consulting and Clinical Psychology*, 50, 138-140. A 36-year-old Vietnam veteran was treated for the anxiety-related symptoms of a PTSD. Therapy consisted of 19 sessions over a 22-day inpatient hospitalization. Primary treatment was the exposure technique of imaginal flooding using the intrusive thoughts (nightmares, flashbacks) associated with the traumatic events. Self-monitored data, psychological test instruments, and physiological responding (heart rate) during scene presentation provided empirical, objective evidence for treatment efficacy. A 12-month follow-up assessment indicated improved adjustment as supported by employment status, residential stability, emotional involvement, and self-report of anxiety, nightmares, and flashbacks.

NISHITH, P., & RESICK, P.A. (in press). **Cognitive-behavioral intervention.** In D.J. Miller (Ed.), *Handbook of PTSD*. New York: Plenum. Through the 1970s and 1980s cognitive-behavioral theories have emerged as viable alternatives to crisis theory and

dynamic theory in the development of structured, research-based treatment protocols for PTSD. This chapter focuses on the theoretical underpinnings of the different cognitive-behavioral approaches and the therapies that have evolved from these approaches. The authors review the literature on systematic desensitization, stress inoculation training, flooding, prolonged exposure, eye movement desensitization and reprocessing, cognitive processing therapy, and cognitive-behavioral therapy with children. They find that cognitive-behavioral interventions with single or multiple treatment components, in general, result in decrease or remission of posttrauma sequelae when compared to wait-list controls. Current directions of research, such as adapting existing protocols to differing populations, mechanisms through which treatments work, markers of recovery, and comorbidity, are also discussed. [Adapted from Text]

PITMAN, R.K., ALTMAN, B., GREENWALD, E., LONGPRE, R.E., MACKLIN, M.L., POIRE, R.E., & STEKETEE, G.S. (1991). **Psychiatric complications during flooding therapy for post-traumatic stress disorder.** *Journal of Clinical Psychiatry*, 52, 17-20. The authors use six case vignettes to illustrate underrecognized complications occurring during flooding therapy for PTSD, including exacerbation of depression, relapse of alcoholism, and precipitation of panic disorder. A common denominator to the majority of these cases appears to be the mobilization of negative posttrauma appraisal, accompanied by shame, guilt, and anger. The authors suggest that flooding may not be helpful for these negative emotions in the manner that it is for anxiety. Suggestions for preventing and treating complications of flooding therapy for PTSD include employing more cognitive forms of therapy in cases at risk; supporting abstinence from alcohol and other substances; providing adjunctive pharmacologic treatment as indicated, e.g., tricyclics for depression or panic; and providing long-term follow-up.

RICHARDS, D.A., LOVELL, K., & MARKS, I.M. (1994). **Post-traumatic stress disorder: Evaluation of a behavioral treatment program.** *Journal of Traumatic Stress*, 7, 669-680. The relative values of imaginal and real-life exposure exercises were tested in this study by randomizing 14 patients who met DSM-III-R criteria for PTSD at least 6 months after the initiating trauma to one of two groups. Group 1 ($n = 7$) had four weekly, hour-long sessions of imaginal exposure followed by four weekly, hour-long sessions of live exposure. Group 2 ($n = 7$) had the reverse order of four live exposure sessions followed by four imaginal exposure sessions. Both groups improved significantly on both PTSD-specific measures and measures of general health post-treatment, and significantly further on 7 out of 12 measures at follow-up 12 months post-treatment. Clinical improvement was in the order of 65-80 percent reduction in target symptoms. On one measure only (problem 2 - phobic avoidance), live exposure yielded more improvement than imaginal exposure whether given first or second. The importance of both live and imaginal exposure to all relevant cues, behavioral and cognitive, is discussed, together with the value of self-exposure homework for patients with PTSD.

ROTHBAUM, B.O., & FOA, E.B. (1991). **Exposure treatment of PTSD concomitant with conversion mutism: A case study.** *Behavior Therapy*, 22, 449-456. A case report of the successful treatment by exposure of a woman diagnosed with PTSD concomitant with conversion mutism is described. PTSD and conversion disorder are both thought to be caused by emotionally traumatic experiences, but the symptomatology is quite different. Etiological theories of the two disorders are discussed, and

mechanisms underlying the successful outcome of exposure treatment are considered.

ROTHBAUM, B.O., HODGES, L., ALARCON, R., READY, D., SHAHAR, F., GRAAP, K., PAIR, J., HEBERT, P., GOTZ, D., WILLS, B., & BALTZELL, D. (in press). **Virtual reality exposure therapy for PTSD Vietnam veterans: A case study.** *Journal of Traumatic Stress*. Virtual reality (VR) integrates real-time computer graphics, body tracking devices, visual displays, and other sensory input devices to immerse a participant in a computer-generated virtual environment that changes in a natural way with head and body motion. VR exposure (VRE) is proposed as an alternative to typical imaginal exposure treatment for Vietnam combat veterans with posttraumatic stress disorder (PTSD). This report presents the results of the first Vietnam combat veteran with PTSD to have been treated with VRE. The patient was exposed to two virtual environments, a virtual Huey helicopter flying over a virtual Vietnam and a clearing surrounded by jungle. The patient experienced a 34% decrease on clinician-rated PTSD and a 45% decrease on self-rated PTSD.

TARRIER, N., PILGRIM, H., SOMMERFIELD, C., FARAGHER, B., REYNOLDS, M., GRAHAM, E., & BARROWCLOUGH, C. (1999). **A randomized trial of cognitive therapy and imaginal exposure in the treatment of chronic posttraumatic stress disorder.** *Journal of Consulting and Clinical Psychology*, 67, 13-18. A randomized trial was performed in which imaginal exposure (IE) and cognitive therapy (CT) were compared in the treatment of chronic PTSD. Patients who continued to meet PTSD caseness at the end of a 4-week symptom-monitoring baseline period ($n = 72$) were randomly allocated to either IE or CT. There was a significant improvement in all measures over treatment and at follow-up, although there were no significant differences between the two treatments at any assessment. A significantly greater number of patients who showed worsening over treatment received IE, although this effect was not found at follow-up. Patients who worsened showed a greater tendency to miss treatment sessions, rated therapy as less credible, and were rated as less motivated by the therapist. It was concluded that either exposure or a challenge to cognition can result in symptom reduction, although neither resulted in complete improvement.

ADDITIONAL CITATIONS Annotated by the Editorial Staff

BOUDEWYNS, P.A., HYER, L., WOODS, M.G., HARRISON, W.R., & MCCRANIE, E. (1990). **PTSD among Vietnam veterans: An early look at treatment outcome using direct therapeutic exposure.** *Journal of Traumatic Stress*, 3, 359-368.

Assigned 58 Vietnam veterans with PTSD to receive exposure or conventional therapy as part of an inpatient treatment. Positive outcomes in anxiety, depression, and social skills were more likely in the exposure group.

BOWEN, G.R., & LAMBERT, J.A. (1985). **Systematic desensitization therapy with post-traumatic stress disorder cases.** In C.R. Figley (Ed.), *Trauma and its wake* (Vol. 2, pp. 280-291). New York: Brunner/Mazel.

Measured responses to viewing combat stress and non-combat stress scenes in 10 veterans with PTSD. Initially subjects were more distressed when viewing combat scenes. After therapy, their reactions to the two types of scenes did not differ significantly.

BREWIN, C.R., DALGLEISH, T., & JOSEPH, S. (1996). **A dual representation theory of posttraumatic stress disorder.** *Psychological Review*, 103, 670-686.

Presents a cognitive model of two types of memories for traumatic events: Consciously processed, verbally accessible memories, and nonconscious, situationally accessible memories. Different PTSD symptoms can be linked to the two processes and require different treatment.

BROM, D., KLEBER, R.J., & DEFARES, P.B. (1989). **Brief psychotherapy for posttraumatic stress disorders.** *Journal of Consulting & Clinical Psychology*, 57, 607-612.

Randomly assigned 112 people meeting DSM-III criteria for PTSD to psychodynamic treatment, hypnotherapy, trauma desensitization, or waiting list. The therapies were equally effective in reducing symptoms.

DEBLINGER, E., MCLEER, S.V., & HENRY, D. (1990). **Cognitive behavioral treatment for sexually abused children suffering post-traumatic stress: Preliminary findings.** *Journal of the American Academy of Child & Adolescent Psychiatry*, 29, 747-752.

Treated 19 sexually abused girls and their non-offending caretakers with 12 sessions of cognitive-behavioral therapy. Pre- and post-assessments revealed significant improvement in PTSD.

ECHEBURUA, E., DE CORRAL, P., ZUBIZARRETA, I., & SARASUA, B. (1997). **Psychological treatment of chronic post-traumatic stress disorder in victims of sexual aggression.** *Behavior Modification*, 21, 433-456.

Randomly assigned 20 female rape victims with severe PTSD to gradual self-exposure and cognitive restructuring therapy or progressive relaxation training. The former was clearly superior to the latter in reducing PTSD.

FOA, E.B., DANCU, C.V., HEMBREE, E.A., JAYCOX, L.H., MEADOWS, E.A., & STREET, G.P. (1999). **A comparison of exposure therapy, stress inoculation training, and their combination for reducing posttraumatic stress disorder in female assault victims.** *Journal of Consulting and Clinical Psychology*, 67, 194-200.

Randomly assigned 96 women with PTSD due to assault to prolonged exposure therapy, stress inoculation training, combined exposure and inoculation, or wait-list control. All treatments yielded superior outcomes relative to the wait list.

FOA, E.B., & MEADOWS, E.A. (1997). **Psychosocial treatments for posttraumatic stress disorder: A critical review.** *Annual Review of Psychology*, 48, 449-480.

Reviews the literature on timing and efficacy of crisis intervention, hypnotherapy, psychodynamic, and cognitive-behavioral treatments. The authors include "gold standards" for therapy-outcome study design and find cognitive-behavioral therapies to have the best-documented successes.

FRANK, E., ANDERSON, B., STEWART, B.D., DANCU, C., HUGHES, C., & WEST, D. (1988). **Efficacy of cognitive behavior therapy and systematic desensitization in the treatment of rape trauma.** *Behavior Therapy*, 19, 403-420.

Randomly assigned 84 treatment-seeking rape victims to cognitive-behavioral therapy or systematic desensitization. Both resulted in clinically significant improvement in symptoms.

FRUEH, B.C., TURNER, S.M., BEIDEL, D.C., MIRABELLA, R.F., & JONES, W.J. (1996). **Trauma Management Therapy: A**

preliminary evaluation of a multicomponent behavioral treatment for chronic combat-related PTSD. *Behavior Research & Therapy*, 34, 533-543.

Treated Vietnam veterans with PTSD with a combination of imaginal flooding and group therapy. Eleven subjects completed treatment and were improved on clinician-rated, self-rated, and physiological measures.

HICKLING, E.J. & BLANCHARD, E.B. (1997). **The private practice psychologist and manual-based treatments: Post-traumatic stress disorder secondary to motor vehicle accidents.** *Behavior Research and Therapy*, 35, 191-203.

Implemented a pilot study of cognitive-behavioral treatment of PTSD in MVA. Ten patients were treated using a manualized protocol. There was significant improvement in PTSD symptoms immediately and 3 months post-treatment.

KILPATRICK, D.G., VERONEN, L.J., & RESICK, P.A. (1982). **Psychological sequelae to rape: Assessment and treatment strategies.** In D. Dolays & R. Meredith (Eds.), *Behavioral medicine: Assessment and treatment strategies* (pp. 473-497). NY: Plenum.

Reviews the literature on the effects of rape and discusses treatment, emphasizing behavioral approaches.

MARKS, I.M., LOVELL, K., NOSHIRVANI, H., LIVANOU, M., & THRASHER, S. (1998). **Treatment of posttraumatic stress disorder by exposure and/or cognitive restructuring: A controlled study.** *Archives of General Psychiatry*, 55, 317-325.

Randomly assigned 77 PTSD patients to receive either prolonged exposure, cognitive restructuring, combined exposure and restructuring, or relaxation training. All treatments were equivalently effective in reducing PTSD symptoms.

PITMAN, R.K., ORR, S.P., ALTMAN, B., LONGPRE, R.E., POIRE, R.E., MACKLIN, M.L., MICHAELS, M.J., & STEKETEE, G.S. (1996). **Emotional processing and outcome of imaginal flooding therapy in Vietnam veterans with chronic posttraumatic stress disorder.** *Comprehensive Psychiatry*, 37, 409-418.

Examined effectiveness of EMDR with and without eye movements in treating seventeen Vietnam veterans with chronic PTSD. Both were equally effective in reducing symptoms.

RESICK, P.A. & SCHNICKE, M.K. (1992). **Cognitive processing therapy for sexual assault victims.** *Journal of Consulting and Clinical Psychology*, 60, 748-756.

Treated nineteen rape victims with cognitive-processing therapy and compared them to a waiting-list sample of 20 rape victims. Treated patients achieved and maintained significant improvement in both PTSD and depression.

ROTHBAUM, B.O. & FOA, E.B. (1992). **Exposure therapy for rape victims with post-traumatic stress disorder.** *The Behavior Therapist*, 15, 219-222.

Discusses theory of and describes procedures of exposure therapy for rape victims. Evidence of success and examples of treatment sessions are included.

THOMPSON, J.A., CHARLTON, P.F.C., KERRY, R., LEE, D., & TURNER, S.W. (1995). **An open trial of exposure therapy based on deconditioning for post-traumatic stress disorder.** *British Journal of Clinical Psychology*, 34, 407-416.

Treated 23 patients with PTSD or subsyndromal symptoms with a debriefing session followed by eight weekly sessions of imaginal and in vivo exposure, resulting in significant reductions in symptoms from pre- to post-treatment on CAPS scores.

RECENT RESEARCH AT THE NATIONAL CENTER FOR PTSD

During FY 1998, research at the National Center for PTSD focused on a range of topics designed to advance the clinical care and welfare of America's veterans.

Assessment. The Center has worked on developing and refining measures to improve diagnostic accuracy and to assess traumatic exposure. Most of this research is conducted by the Center's Behavioral Science Division, which has developed the Clinician Administered PTSD Scale and other widely used measures. In FY 1998, the CAPS was translated from English into eight other languages. Another area of assessment research was the development and testing of brief, cost-effective PTSD screening measures to be used in primary-care settings.

Causes and consequences. Psychobiology is an important part of the Center's research program. Most of this work is conducted at the Clinical Neurosciences Division, where one line of investigation has focused on the hippocampus. This research has revealed less hippocampal volume and greater memory deficits in male Vietnam veterans with PTSD. During FY 1998, the Division found that these results also apply to women. The Behavioral Science and Education Divisions are collaborating on a related study that combines neuroimaging, electrophysiological, and behavioral methods to study the hippocampus in individuals with PTSD. In addition, the Sleep Laboratory at the Education Division is conducting ongoing laboratory and ambulatory sleep research protocols aimed at understanding the sleep complaints of PTSD patients.

The Behavioral Science Division, in collaboration with the Women's Health Sciences Division, reported on the impact of premilitary, war-zone, and postmilitary factors on PTSD symptom severity in Vietnam veterans. This work points to the importance of examining exposure to multiple stressful events over time rather than concentrating on the impact of a single traumatic event. The Executive, Behavioral Science, and Women's Health Sciences Divisions also investigated the physical health consequences associated with trauma and PTSD.

Treatment. The development and evaluation of new treatments for PTSD has always been a significant focus of the Center's research activity. The Executive Division led the primary study on treatment in FY 1998, CS#420, a 10-site randomized clinical trial of trauma focus group therapy for combat-related PTSD in male Vietnam veterans. The study, the largest PTSD treatment study ever funded by the VA, is expected to be completed in June, 2000.

A variety of projects focused on other forms of psychotherapy. One study evaluated a structured, brief group treatment that targets ambivalence about changing PTSD symptoms and comorbid problem behaviors in male Vietnam veterans. Another project examined effective treatments for anger in veterans with PTSD. Additional studies addressed PTSD problems from nonmilitary stressors affecting veterans. One such project is a randomized clinical trial of exposure and cognitive restructuring for treating PTSD in adult female survivors of childhood sexual abuse.

Another, conducted in conjunction with the DoD, is a randomized clinical trial to evaluate a cognitive approach to treating female victims of spousal battering.

The Clinical Neurosciences Division began an innovative study to test whether the beta-blocker propranolol administered within the first 24 hours after a rape will help to lessen the severity of traumatic memories in rape victims. The Division also expanded a double-blind, placebo-controlled trial of clonidine, which is not a beta-blocker but, like propranolol, reduces acute stress-induced neurotransmitter changes.

Evaluation research. Since 1988, the Northeast Program Evaluation Center has served as the Evaluation Division of the Center. In 1998, the Division issued the third report of the National Mental Health Program Performance Monitoring System. The Evaluation Division also issued the third report on the treatment outcomes of specialized PTSD inpatient programs. These data are used widely in making programmatic changes as part of VA's commitment to continuous improvement in the cost-effectiveness of service delivery. Close attention to maintaining clinical focus and maximizing efficiency has resulted in a doubling in the number of veterans receiving specialized PTSD treatment at VAMCs, from 33,015 in 1995 to 66,625 in 1998.

Special populations. Some research efforts were aimed at understanding and dealing with the unique circumstances of special populations. During the past year, the 4th wave of data was collected in a longitudinal study of approximately 3,000 male and female veterans who served in the Gulf War shortly after these veterans returned home in 1991. The Clinical Neurosciences Division continued its work on another longitudinal study of Gulf War veterans.

Center research integrates women into projects whenever possible, while selected projects focus exclusively on women. For example, the Women's Health Sciences Division continued to disseminate findings from a survey of women veterans' perceptions and experiences in accessing VA health care services. A follow-up study of women veterans who use VA care is currently proposed to examine the factors associated with a history of sexual assault.

The Center also has been active in research on the needs of veterans from ethnocultural minority groups. In FY 1998, data analysis continued on the Matsunaga Vietnam Veterans Project, a large epidemiological study modeled on the NVVRS, which targeted Vietnam veterans of American Indian and Asian/Pacific Islander ethnic backgrounds. In addition, the Pacific Islands Division continued its effort to develop a questionnaire for assessing race-related events with Asian American Vietnam veterans.

The Center expanded its investigations into the effects of active duty-related stressors. The Women's Health Sciences Division entered its second year of the DoD-funded research on women in the Marine Corps. The Clinical Neurosciences Division, in collaboration with DoD, is investigating the biological and psychological effects of high-intensity military training. Prospective longitudinal

studies of PTSD are underway to determine if it is possible to identify resilient and vulnerable subgroups.

The Behavioral Sciences Division has been at the forefront of investigating the psychological consequences of peacekeeping missions for U.S. military personnel. A study of military personnel in Bosnia, conducted in collaboration with Walter Reed Army Institute of Research, is a landmark effort: for the first time, mental health status prior to deployment was assessed, so that it will be possible to determine the impact of military deployment.

For more information about Center activities in FY 1998, see the Center's Web site: www.dartmouth.edu/dms/ptsd/AR98.html

PILOTS UPDATE

When a controlled vocabulary is used to index a bibliographical database, users should begin their search of the literature by consulting the thesaurus in which that vocabulary is set out and the relationships among terms indicated. Even when an index term seems (and is) obvious, using the thesaurus will often suggest ways of improving a search. "Hurricanes" is a term included in the PILOTS Thesaurus. But the thesaurus will also suggest the broader term "Natural Disasters," which some searchers will find useful in ensuring that they retrieve the maximum possible number of papers relevant to their topic.

Often the appropriate term to choose in searching is not so obvious. The feature article in this issue of the *PTSD Research Quarterly* deals with "Exposure Therapy for PTSD." A search of the PILOTS database using the command `FIND TOPIC EXPOSURE ADJ THERAPY` (performed before the Spring update) yields 31 results. But if we use the descriptor "Implosive Therapy," as the PILOTS Thesaurus tells us to do, we retrieve 102 citations. These include 26 of the 31 terms we found in our first search; the other five are indexed under "systematic desensitization therapy" or other terms that appear more exactly to describe their content.

There are two lessons to be learned from this. One is that using the PILOTS Thesaurus will lead to more effective searching of the PILOTS database. (This applies to other databases as well: MEDLINE and PSYCINFO searches will also produce better results if the appropriate thesauri are used in planning them.) The other is that a controlled vocabulary does not always use what would seem to be the obvious terminology. Why is this?

When the PILOTS database was started nearly 10 years ago, a preliminary set of terms was chosen by examining the existing traumatic stress literature. Over ten years there have been additions to the language of PTSD research, and changes in the way that terms are used. (For example, many writers now use "critical incident stress debriefing" in a broader sense than CISD's inventor intended.) When we chose "Implosive Therapy" as the descriptor to cover flooding, imaginal exposure, and image habituation training, we were guided not only by our sense of the contemporary literature but also by the example of the *Thesaurus of Psychological Index Terms*, which used that term in indexing *Psychological Abstracts* and PSYCINFO.

Terms change over time. Has the traumatic stress field adopted "Exposure Therapy" so widely that we should substitute it for "Implosive Therapy" in the PILOTS Thesaurus? The fact that the leading experts who have surveyed the topic for this *Research Quarterly* chose to title their article "Exposure Therapy for PTSD" would suggest that we should at least consider it. And consider it we shall, as part of the ongoing process of keeping the PILOTS Thesaurus up-to-date as a useful key to the traumatic stress literature.

But we shall also remember the value of consistency in indexing, and the disadvantages of requiring experienced users of the PILOTS database to adapt to frequent changes in indexing terminology. In deciding what to do about the exposure therapy literature we shall, as always, try to strike the best balance between innovation and consistency. The choice we make will be reflected in the PILOTS Thesaurus—which will continue to be the best place to begin a search of the traumatic stress literature.

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